



UNIVERSITI PUTRA MALAYSIA

**THE EFFECTS OF VERBAL PROBLEM SOLVING INSTRUCTION ON
STUDENTS' STRUCTURING ACQUISITION AND RETENTION OF
KNOWLEDGE IN METHODS OF COOKING**

ALIAH HJ. AHMAD SHAH.

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By

ALIAH HJ. AHMAD SHAH

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fulfilment of the requirement for the degree of Doctor of Philosophy

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Chairperson: Associate Professor Mohd. Majid Bin Konting, PhD

Faculty: Educational Studies

The purpose of this study is to examine the effects of teaching verbal problem solving to students' structuring, acquisition and retention of knowledge in Methods of Cooking. The study is carried out on 148 students from two classes each of Catering Technology (n=77) and Food Management (n=71). Taken as intact, the classes are randomly assigned into two experiment (n=37; n=35) and two control (n=40; n=36) groups. Using a quasi-experimental of non-equivalent control group of pretest, posttest and delayed posttest design, 10 treatment of teaching using verbal problem solving is given for a duration of 40 minutes of classroom teaching for four weeks. For the pretest, posttest and delayed posttest, parallel achievement tests are used to demonstrate the amount of knowledge acquired and retained after the treatment. A concept mapping test is used to assess the knowledge structure of the students before

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KESAN PENGAJARAN PENYELESAIAN MASALAH SECARA VERBAL
TERHADAP STRUKTUR, PENGUASAAN DAN PENGEKALAN
PENGETAHUAN DALAM KAEDAH MEMASAK**

Oleh

ALIAH HJ. AHMAD SHAH

Mei 2005

Pengerusi: Professor Madya Mohd. Majid Bin Konting, PhD

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Tujuan kajian ini ialah untuk mengkaji kesan pengajaran penyelesaian masalah secara lisan ke atas penstrukturan, penguasaan dan pengekalan pengetahuan pelajar dalam Kaedah Memasak. Kajian dijalankan ke atas 148 pelajar daripada dua kelas Teknologi Katering (n=77) dan dua kelas Pengurusan Makanan (n=71). Sampel kajian yang berada dalam kelas asal diperuntukkan secara rawak kepada dua kelas eksperimen (n=37; n=35) dan dua kelas kawalan (n=40; n=36). Dengan menggunakan kaedah kuasi eksperimen kumpulan kawalan tak setara dengan ujian pra, ujian pasca dan ujian pasca yang dilewatkan, rawatan menggunakan penyelesaian masalah secara lisan diberi selama 10 kali 40 minit pengajaran dalam bilik darjah untuk tempoh empat minggu. Untuk ujian pra, ujian pasca dan ujian pasca yang dilewatkan, ujian pencapaian setara digunakan bagi menunjukkan

pengetahuan yang dikuasai dan yang dikekalkan selepas rawatan. Ujian peta konsep digunakan untuk mentaksir struktur pengetahuan pelajar sebelum dan selepas rawatan. Ujian pasca yang dilewatkan bagi pengekalan pengetahuan diberi selepas sembilan minggu tempoh rawatan selesai.

Dapatan kajian menunjukkan bahawa pengajaran penyelesaian masalah dapat meningkatkan dengan berkesan min ujian pasca bagi penstrukturan pengetahuan dalam Kaedah Memasak bagi pelajar dalam kumpulan eksperimen bagi Teknologi Katering ($t=18.23$, $p<.01$); Pengurusan Makanan ($t=23.19$, $p<.01$); dan skor bagi Teknologi Katering dan Pengurusan Makanan yang digabungkan ($t=28.27$, $p<.01$). Dapatan kajian juga menunjukkan min ujian pasca untuk penstrukturan pengetahuan dalam Kaedah Memasak bagi pelajar dalam kumpulan eksperimen adalah lebih tinggi daripada min ujian pasca untuk penstrukturan pengetahuan dalam Kaedah Memasak bagi pelajar kumpulan kawalan bagi Teknologi Katering ($F=47.02$, $p<.01$) dan skor Teknologi Katering dan Pengurusan Makanan yang digabungkan ($F=21.97$, $p<.01$). Min skor ujian pasca bagi penguasaan pengetahuan pelajar dalam kumpulan eksperimen juga adalah lebih tinggi secara bererti daripada min skor ujian pasca pelajar dalam kumpulan kawalan bagi pelajar Teknologi Katering ($F=6.33$, $p<.05$), Pengurusan Makanan ($F=15.46$, $p<.01$) dan skor Teknologi Katering dan Pengurusan Makanan yang digabungkan ($F=21.17$, $p<.01$). Bagaimanapun pengajaran kaedah penyelesaian masalah secara verbal ini tidak dapat membantu dalam pengekalan pengetahuan secara berkesan untuk pelajar-pelajar Teknologi Katering ($F=.30$, $p>.05$), Pengurusan

Makanan ($F=1.56$, $p>.05$) dan skor Teknologi Katering dan Pengurusan Makanan yang digabungkan ($F=1.45$, $p>.05$).

Kajian ini menunjukkan kaedah pengajaran penyelesaian masalah secara lisan adalah satu strategi pengajaran yang efektif untuk penstrukturan pengetahuan bagi mata pelajaran Teknologi Katering. Kajian juga menunjukkan pengajaran penyelesaian masalah secara lisan ini merupakan satu teknik yang berkesan untuk penguasaan pengetahuan bagi kedua-dua mata pelajaran Teknologi Katering dan Pengurusan Makanan. Bagaimanapun kajian ini menunjukkan bahawa pengajaran penyelesaian masalah secara lisan tidak menunjukkan kesan yang jelas terhadap pengekaln pengetahuan dalam mata pelajaran Teknologi Katering dan Pengurusan Makanan.

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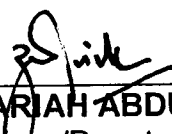
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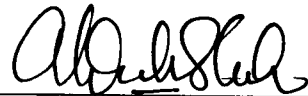


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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.



ALIAH BT. HJ. AHMAD SHAH

Date: 18 AUGUST 2005

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LIST OF ABBREVIATIONS

ALT	Assimilation Learning Theory
PGT	Proposition Generating Task
N	Number of subjects
df	Degree of freedom
M	Mean
SD	Standard Deviation
SEM	Standard Error Mean
MD	Mean Difference
MS	Mean Square
P	Significant level
η^2	Etta Squared

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The Assimilation Learning Theory (ALT) by Ausubel (1968) consists of six basic concepts for meaningful learning. The six basic concepts are subsumption, progressive differentiation, integrative reconciliation, obliterative subsumption, superordinate learning and advance organizer. Subsumption is a process whereby new knowledge is accreted from the cognitive structure of the learner. Accretion of new knowledge is facilitated by the availability of preacquired ideas in the cognitive structure. The presence of relevant, clear and stable preacquired ideas in the learner's cognitive structure facilitates meaningful learning. Current knowledge that interacts with the relevant background knowledge in the cognitive structure is assimilated to form new knowledge structure. The construction of new knowledge structures continues through the process of meaningful learning.

As new knowledge is acquired, concepts and propositions become more elaborate. The formation of interconnections of concepts and linkages between concepts take place in a manner of 'progressive differentiation'. As new linkages are formed, subordinate concepts acquire new meanings and 'superordinate learning' takes place. Superordinate learning involves

modifications of previously learned concepts and/or propositions, which also results in progressive differentiation of cognitive structure. As superordinate learning occurs, concepts and propositions that are seen as discrete or in conflict may be integrated into new higher order concept meanings. This process is termed by Ausubel (1968; 2000) as 'integrative reconciliation'. Integrative reconciliation continues as learners gain more meanings and linkages to distinct concepts.

Knowledge gained through meaningful learning is subsumed in the cognitive structure. The new meaningful knowledge is retained much longer than knowledge that is rote learned. However, learning and forgetting in rote learning are not equivalent to learning and forgetting in meaningful learning. Ausubel (1968; 2000) coined the term 'obliterative subsumption' to represent forgetting in meaningful learning. By obliterative subsumption, a meaningfully gained knowledge is not forgotten entirely. Residual concepts remain after subordinate concepts and details are lost. The residual concepts form anchoring ideas in cognitive structure. These anchoring ideas will be useful to facilitate new relevant meaningful learning when required.

Knowledge could be more easily linked to existing relevant concepts in cognitive structure by the use of 'advance organizer'. Ausubel emphasizes that advance organizers are different from overviews and summaries. Organizers act as a subsuming bridge between new learning material and existing related ideas. The function of an advance organizer is to connect